# UNITED STATES PATENT OFFICE.

GEORGE E. MARSHALL, OF TURNER'S FALLS, MASSACHUSETTS.

## IMPROVEMENT IN TREATING WOOD TO IMITATE MANILA-PAPER PULP.

Specification forming part of Letters Patent No. **207,428**, dated August 27, 1878; application filed July 12, 1878.

*To all whom it may concern:*

Be it known that I, GEORGE E. MARSHALL, of Turner's Falls, in the county of Franklin and Commonwealth of Massachusetts, have made a new and useful Improvement in the Process of Preparing Wood for Wood Pulp, to be used in the manufacture of an imitation of Manila paper; and that the following is a clear and exact description of the same.

This invention relates to that class of processes in the preparation of wood pulp for the manufacture of paper where the resin, gum, and other deleterious substances are dissolved and partially removed by mechanical means; and consists in applying heated water under a pressure many times greater than would be produced by the heat employed.

It is well understood that most of the wood for wood pulp, being necessarily cut in the winter, becomes dry, hard, and seasoned before it can be used, and the resin, gum, and other foreign substances become solidified and fixed. To remove these substances, and to bring the wood thus dried and hardened to a suitable condition to be worked, various methods have been employed, some mechanical, by long boiling in open vats, or by subjecting the wood to a high degree of steam-heat; some chemical, by boiling it in an alkali, which requires the wood to be afterward bleached, and others, all of which are in some way objectionable, either tedious or expensive, or both, and often fail to accomplish the desired result.

I purpose to prepare the wood for use by the action of hot water under a heavy pressure.

The wood, having been cut, split, and prepared in the manner common for such use, is placed in a close vessel or tank, made tight and strong enough to resist a pressure, if necessary, of four hundred and fifty pounds to the square inch, and is closely packed. At the bottom of this tank is an opening with a valve through which the water, previously heated to a point above boiling and below 280°, is forced by a hydraulic press to such an extent as to saturate and to completely permeate the wood, and to soften and to drive out of the pores the gum, resins, and acids; and if the temperature is kept sufficiently hot, it gives the pulp the desired color belonging to a finely-made Manila paper. This may be aided somewhat by the introduction of a small quantity of some alkaline substance to act on the acids.

The water may be heated in a coil outside and forced into the tank by a hydraulic press. The water thus heated and forced in leaves the wood for the pulp in the most desirable condition for work and for color.

Pulp made from wood treated below the boiling-point will be white; but I secure the desired Manila color by raising the temperature to 240° or 250° for a light Manila, and as high as 280° for a dark pulp.

In my patent of July 17, 1877, I employed a part of this process; but that was for the preparation of pulp for white paper only, and would not accomplish the purpose of the present application, which is to leave the pulp stronger and of the color desired for my use.

I wish it distinctly understood that my process differs from any other in this, that although I have water heated above the boiling-point and under pressure, yet the pressure within the tank is by the mechanical action of the hydraulic press, and not due to the expansive force of steam. No pressure is required from the steam above three atmospheres; but the press may give from four hundred and fifty to five hundred pounds to the square inch, and practice has shown that the greater the pressure the more speedy is the operation on the wood.

I claim—

Preparing wood for an imitation Manila-paper pulp by the process above described, substantially in using water at a degree of heat between 212° and 280°, and under a very heavy hydraulic pressure, by which the wood is brought to a proper condition to work and the desired color obtained for the pulp.

GEO. E. MARSHALL.

Witnesses:
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